Amendments to the Claims

Claim 1 (currently amended) An apparatus for taking absorbance-based chemical measurements comprising a reagent-based optical chemical sensor comprising an analyte-selective reagent, and means for renewing said reagent~~, means for~~ and allowing said reagent to reach equilibrium with an analyte ~~and, means for calculating the~~ wherein sensor response is calculated from a ratio of the absorbance of said reagent determined relative to a blank solution.

Claim 2 (original) The apparatus of claim 1, wherein said analyte-selective reagent is colorimetric.

Claim 3 (original) The apparatus of claim 1, wherein said analyte-selective reagent is flourescent.

Claim 4 (original) The apparatus of claim 1, wherein said means for renewing said reagent comprises a pump and at least one valve.

Claim 5 (original) The apparatus of claim 1, wherein said means for renewing said reagent is selected from the group consisting of at least one peristaltic pump, at least one syringe pump, at least one positive displacement pump, at least one solenoid pump and valve and at least one pinch valve.

Claim 6 (original) The apparatus of claim 1, wherein said means for renewing said reagent comprises a solenoid pump and valve.

Claim 7 (currently amended) The apparatus of claim 1, wherein said ~~means for calculating the~~ sensor response is calculated using ~~includes~~ the equation $A_R=A_{\lambda 1}/A_{\lambda 2}$, where A_R is said sensor response, $A_{\lambda 1}$ is absorbance at $\lambda 1$ and $A_{\lambda 2}$ is absorbance at $\lambda 2$ and, wherein $A_{\lambda 1}$ and $A_{\lambda 2}$ are determined by

$$A_\lambda=-\log \frac{I_\lambda}{I_{\lambda o}}.$$

Claim 8 (original) The apparatus of claim 1, wherein said reagent-based optical chemical sensor is a Submersible Autonomous Moored Instruments for CO_2.

Claim 9 (original) The apparatus of claim 8, wherein said analyte-selective reagent is bromothymol blue.

Claim 10-11 (canceled)

Claim 12 (currently amended) The apparatus of claim 8, wherein said ~~means for calculating~~ sensor response is calculated using ~~includes~~ the equation $A_R=A_{\lambda 1}/A_{\lambda 2}$, where A_R is said sensor response, $A_{\lambda 1}$ is absorbance at $\lambda 1$ and $A_{\lambda 2}$ is absorbance at $\lambda 2$ and, wherein $A_{\lambda 1}$ and $A_{\lambda 2}$ are determined by

$$A_\lambda = -\log \frac{I_\lambda}{I_{\lambda o}}.$$

Claim 13 (currently amended) A method of taking absorbance-based chemical measurements comprising the steps of:

a) ~~utilizing~~ taking an absorbance reading of a blank solution with a reagent-based optical chemical sensor comprising an analyte-selective reagent, wherein said sensor has been modified to allow the renewal of a analyte-selective reagent;

b) renewing said analyte-selective reagent;

c) equilibrating said renewed analyte-selective reagent to said analyte; ~~and~~

d) taking an absorbance reading of said equilibrated analyte-selective reagent and analyte; and

d) e) calculating the sensor response from a ratio of the absorbance of said equilibrated analyte-selective reagent and analyte determined relative to ~~a~~ said absorbance of said blank solution.

Claim 14 (original) The method of claim 13, wherein said analyte-selective reagent is colorimetric.

Claim 15 (original) The method of claim 13, wherein said analyte-selective reagent is flourescent.

Claim 16 (original) The method of claim 13, wherein said reagent is renewed by a pump and at least one valve.

Claim 17 (original) The method of claim 16, wherein said pump and at least one valve are selected from the group consisting of at least one peristaltic pump, at least one syringe pump, at least one positive displacement pump, at least one solenoid pump and valve and at least one pinch valve.

Claim 18 (original) The method of claim 13, wherein said reagent is renewed by a solenoid pump and valve.

Claim 19 (original) The method of claim 13, wherein said sensor response is calculated using the equation $A_R=A_{\lambda 1}/A_{\lambda 2}$, where A_R is said sensor response, $A_{\lambda 1}$ is absorbance at $\lambda 1$ and $A_{\lambda 2}$ is absorbance at $\lambda 2$ and, wherein $A_{\lambda 1}$ and $A_{\lambda 2}$ are determined by

$$A_\lambda = -\log \frac{I_\lambda}{I_{\lambda o}}.$$

Claim 20 (original) The method of claim 13, wherein said reagent-based optical chemical sensor is a Submersible Autonomous Moored Instruments for CO_2.

Claim 21 (original) The method of claim 20, wherein said analyte-selective reagent is bromothymol blue.

Claim 22-23 (canceled)

Claim 24 (original) The method of claim 20, wherein said sensor response is calculated using the equation $A_R=A_{\lambda 1}/A_{\lambda 2}$, where A_R is said sensor response, $A_{\lambda 1}$ is absorbance at $\lambda 1$ and $A_{\lambda 2}$ is absorbance at $\lambda 2$ and, wherein $A_{\lambda 1}$ and $A_{\lambda 2}$ are determined by

$$A_\lambda=-\log \frac{I_\lambda}{I_{\lambda o}}.$$